REMARKS

Claims 1-18 are pending. Claims 1, 6, and 11 have been amended, claims 9, 10, 12, and 13 were previously presented, and claims 2-5, 7 and 8 were previously amended, and claims 14-18 are new.

Rejection Under 35 U.S.C. § 103 (a)

Claims 1-13 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over Tomlinson et al., "Fade Countermeasures at Ka Band: Direct Inter-establishment Communications Experiment (DICE)', IEEE Colloquium, December 17, 1991, pages 4/1 – 4/6.

Applicant has avoided these grounds of rejection for the following reasons.

Applicant's claim 1, as amended, now recites,

"selecting a reduced information data rate that is a fraction of a full data rate R, wherein the reduced information data rate is 1/4 of the full data rate R;

randomizing the reduced data rate information signals to produce an encoded data stream at the full data rate R; and

transmitting the encoded data stream;

wherein the reduced information data rate results in an enhanced signal-to-noise ratio, per bit of information, that is increased by a factor of four due to reduction in the information data rate increasing the energy per bit, and wherein transmittal of the encoded data stream at the full data rate ensures that power flux density will not be significantly changed;

wherein the information data rate is decreased without any corresponding increase in the power flux density, the information data rate being reduced to a selected fraction, 1/4, of the full data rate R resulting in an encoded sequence at the full rate R, containing information data at the reduced R/4 rate; and

wherein the effect of transmitting at the reduced information data rate, R/4, is that the signal to noise ratio is increased by a factor of four because reduction in the information data rate increases the energy per bit without change in power flux density because the randomized combined data stream is still being transmitted at the full data rate."

Applicant's claim 6, as amended, now recites,

"means for reducing the rate of an information data stream to be transmitted from a full rate R to a selected reduced rate, wherein the-selected reduced rate is 1/4 of the full data rate R;

a pseudorandom noise source generating a stream of practically random data at the full data rate R;

means for logically combining the reduced rate information data stream and the data stream from the pseudorandom noise generator; and

means for transmitting the logically combined data stream;

wherein signal-to-noise performance of the transmitter is enhanced without increasing power flux density levels;

wherein the reduced information data rate results in an enhanced signal-to-noise ratio, per bit of information, that is increased by a factor of four due to reduction in the information data rate increasing the energy per bit;

wherein the information data rate is decreased without any corresponding increase in the power flux density, the information data rate being reduced to a selected fraction, 1/4, of the full data rate R resulting in an encoded sequence at the full rate R, containing information data at the reduced R/4 rate; and

wherein the effect of transmitting at the reduced information data rate, R/4, is that the signal to noise ratio is increased by a factor of four because reduction in the information data rate increases the energy per bit without change in power flux density because the randomized combined data stream is still being transmitted at the full data rate."

Applicant's claim 11, as amended, now recites,

"a data rate control device operable to reduce the rate of an information data stream to be transmitted from a full rate R to 1/4 of the full data rate R;

a pseudorandom noise source operable to generate a stream of practically random data at the full data rate R;

a first logical exclusive OR circuit operable to combine the reduced rate information data stream and the data stream from the pseudorandom noise generator;

a transmitter operable to send the logically combined data stream;

a receiver operable to demodulate the logically combined data stream;

a second pseudorandom noise source located near the receiver, operable to generate a stream of data identical with the one produced by the first pseudorandom noise source; and

a second logical exclusive OR circuit operable to combine the demodulated data stream with the data stream from the second pseudorandom noise source, to recover the original data stream at the reduced data rate;

wherein the reduced information data rate results in an enhanced signal-to-noise ratio, per bit of information, that is increased by a factor of four due to reduction in the information data rate increasing the energy per bit, and wherein transmittal of the encoded data stream at the full data rate ensures that power flux density will not be significantly changed;

wherein the information data rate is decreased without any corresponding increase in the power flux density, the information data rate being reduced to a selected fraction, 1/4, of the full data rate R resulting in an encoded sequence at the full rate R, containing information data at the reduced R/4 rate; and

wherein the effect of transmitting at the reduced information data rate, R/4, is that the signal to noise ratio is increased by a factor of four because reduction in the information data rate increases the energy per bit without a change in power flux density because the randomized combined data stream is still being transmitted at the full data rate."

In support of the rejection, the Examiner stated: "... Tomlinson et al. discloses digital communication apparatus, as shown in Fig. 1, comprising: means, which is

obvious to have the "means" to perform the feature having the rate of an information data stream to be transmitted from an original signaling rate R to a selected reduced rate using a direct-sequence spread spectrum system [Fig. 1]; a pseudorandom noise source (PRC generator) generating a stream of practically random data at the original signaling rate R (i.e. at a chip rate) [Fig. 1]; means (Exclusive OR) for logically combining the reduced signaling rate information data stream and the data stream from the pseudorandom noise generator Fig. 1]; and means (channel) for transmitting the logically combined data stream at the original signaling rate [Fig. 1]; wherein signal-to-noise performance is enhanced (due to the use of the higher spreading factor) to compensate for rain attenuation (i.e. the fading of signals due to rain) without increasing power levels [page 2; lines 6-10; Page 2, Section 2, line 1 to page 3, line 6].

Regarding the claimed amount rate for reducing the rate of an information data stream to be transmitted from an original signaling rate R to a selected reduced rate using a direct-sequence system [Fig. 1], it would have been obvious to a person of ordinary skill in the art, at the time of the invention, to select any power value of a fraction of a full data rate including a 1/4 of the full data rate as a matter of design choice. Further it would have been obvious to one skilled in the art that the signal amplitude (energy per bit), the data rate and power flux density were all well known terms used to characterize communication signals and further that said terms were all directly related since they derive form the same signals. It would have been obvious to utilize the processing as disclosed by the prior art in order to optimize as many of said terms as possible for a given application."

In response to the previous arguments for patentability the Examiner responded as follows:

"Per applicant's argument that the prior art does not disclose a set value for the decrease in the data rate, the examiner notes that applicant's claims do not either. Applicant's claims recite a relative relationship between the initial data rate and the decreased data rate, which is not a set value. Applicant's claims are directed to an inherent relationship between the data rate, and power (energy amplitude) level and SNR and BER that is are inherent to any communications signals. It is obvious to experiment and design with known signal characteristics in order to design to the particular application."

In the claims and specification a set value refers to a selected fraction, 1/n, of the full data rate R. Regarding the assertion by the Examiner that there is an inherent relationship, the independent claims have been amended to specifically state that the data rate is decreased without any corresponding increase in the power flux density. Thus there is no inherent relationship.

The amendments to the independent claims are supported by the specification on pages 13-15. New claims 14-18 add the element 1/n rather than 1/4.

In accordance with the present invention, the information data rate is decreased without any corresponding increase in the PFD. As shown in Figure 1, digital data at its maximum rate (R) bits per second is subject to data rate control as indicated in box 10, which reduces the information data rate, optionally, to a selected fraction, 1/n, of the full data rate R. The effect of transmitting at the reduced information data rate, such as R/4, is that the ratio E_b/N_0 is increased by a factor of four because reduction in the

information data rate increases the energy per bit, E_b. However, the power flux density is unchanged because the randomized bit stream is still being transmitted at the full data rate. Randomizing the data stream has the effect of spreading it over a broader spectrum. Data recovery at the receiver includes dispreading the data again to recover the reduced data rate information signals.

As previously set forth in the last response Tomlinson discloses reducing the information rate with respect to the chirp rate in a direct sequence spread spectrum system. However, Tomlinson does not disclose a selected value, which is a function of the full data rate, for the decrease in the source data rate. The independent claims of the present application include the limitation: "the reduced information data rate is 1/4 of the full data rate R". This is not simply a design choice. According to the present specification digital data at its maximum rate (R) bits per second is subject to data rate control, which reduces the information data rate, optionally, to a selected fraction, 1/n, of the full data rate R.

Furthermore, each of the independent claims now includes the following: "wherein the information data rate is decreased without any corresponding increase in the power flux density, the information data rate being reduced to a selected fraction, 1/4, of the full data rate R resulting in an encoded sequence at the full rate R, containing information data at the reduced R/4 rate; and wherein the effect of transmitting at the reduced information data rate, R/4, is that the signal to noise ratio is increased by a factor of four because reduction in the information data rate increases the energy per bit without a change in power flux density because the randomized combined data stream is still being transmitted at the full data rate."

Such is neither taught nor suggested by Tomlinson.

The dependent claims include all the limitations of the independent claims upon which they depend, and therefore for the reasons set forth above with regards to the independent claims, these dependent claims are deemed to be allowable over any combination of the cited prior art.

Conclusion

Reconsideration and withdrawal of the rejections is therefore respectfully requested. In view of the above remarks, allowance of all claims pending is respectfully requested.

The prior art made of record and not relied upon is considered to be of general interest only. This application is believed to be in condition for allowance, and such action at an early date is earnestly solicited. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call applicant's attorney.

Respectfully submitted,

John R. Garrett

John R. Garrett
Attorney for Applicant
Reg. No. 27,888

Dated: July 28, 2009

Carmen Patti Law Group, LLC
Customer Number 32205